

REMARKS

Claims 1, 3, 5, and 6 are pending. Claims 1, 3, 5, and 6 have been amended to define still more clearly what Applicants regard as their invention. Claims 1 and 3 are in independent form.

Claims 1, 3, 5, and 6 have been rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent Application Publication No. 2001/0039161 (*Sato*) in view of U.S. Patent No. 6,638,128 (*Suzuki*).

Independent Claim 1 as amended, recites:

1. An energization processing apparatus for performing, in a reduced-pressure atmosphere, an energization process on electric conductors which are placed on a substrate, comprising:
 - a vessel which has an exhaust hole and which covers the electric conductors and one region on a surface of the substrate where the electric conductors are placed, to create an airtight atmosphere between the substrate and the vessel, wherein the vessel does not cover a further region on the surface of the substrate;
 - a first temperature adjusting mechanism for generating a heat quantity to adjust a temperature of the one region; and
 - a second temperature adjusting mechanism for generating a heat quantity to adjust a temperature of the further region, wherein the heat quantity generated by the first temperature adjusting mechanism is different from the heat quantity generated by the second temperature adjusting mechanism.

Conventionally, in case that a substrate has one region covered with a vessel and another region not covered therewith and under atmospheric air, and an atmosphere at the covered region is under reduced-pressure, heat generated by energization processing is transmitted to the atmosphere at varying speed, causing the heat to dissipate faster from the other region. As a result, a temperature difference between the one region and the other

region is created on the substrate surface, thereby causing a risk of cracking the substrate.

See, e.g., paragraph (0012) of U.S. Patent Application Publication No. 2004/0152388.

In order to solve the above problem of the prior art, and according an aspect of the present invention to which Claim 1 relates, different temperature adjusting mechanisms independently generating different heat quantities are provided respectively for the one region of the substrate covered with the vessel and for a further region of the substrate not covered with the vessel. Also, according to an aspect of the present invention to which Claim 3 relates, by heating the further region with a heat quantity larger than a heat quantity provided to the one region, a temperature difference between the one region and the further region can be suppressed.

As pointed out in the Amendment filed on May 30, 2006, Sato discloses that a substrate is covered and hermetically sealed with a vessel, and a plurality of temperature adjusting mechanisms are disposed within a base supporting the substrate. However, all of the temperature adjusting mechanisms in Sato adjust the temperature of the substrate area covered with the vessel only, and none of the temperature adjusting mechanisms adjust the temperature of the area not covered with the vessel. See, e.g., Fig. 3 of Sato. Accordingly, Sato does not provide a uniform temperature distribution throughout the substrate including the area covered with the vessel and the other area not covered with the vessel. The Office Action concedes that "Sato does not disclose the second temperature adjusting mechanism...."

In support of the rejection of Claim 1, the Office Action cites col. 25, line 50 to col. 26, line 10 of Suzuki. That portion of Suzuki states:

"As described above, since the voltage is applied to the multi-electron source in which six lines are simultaneously selected to perform the activation, heat in the substrate is largely increased. Assuming that the activation voltage V_{act} is 16V and I_f of each device immediately before completion of the activation is 3 mA, this heat can reach the following value:

$$Q=16 \times 0.003 \times 3072 \times 6 \times 900 \text{ W}$$

Furthermore, this heat is not necessarily generated uniformly in the entire multi-electron source substrate but concentrated on the matrix device region of the substrate, and it is not generated in the peripheral region such as the outtake wiring section. Reference numeral **102A** represents a heating section of the substrate. Therefore, heater units **Z201-1**, **Z201-2** and water cooling tubes **Z202-1**, **Z202-2**, ...are provided in the substrate supporting base **103** in order to improve or eliminate the generated temperature distribution, and they are controlled by a non-illustrated temperature controller in accordance with each unit so that the entire multi-electron source substrate has a set temperature T_{set} . The temperature control is required because the subsequent device characteristics (I_f , I_e) change in dependence on a temperature of the substrate during the activation and generation of the temperature distribution on the activated substrate causes the characteristic distribution of the multi-electron source to occur.

The installation height of the probe electroconductive member **201** will now be explained with reference to FIG. 29."

It is respectfully submitted, however, that nothing in either Sato or Suzuki would disclose or suggest a first temperature adjusting mechanism for generating a heat quantity to adjust a temperature of one region on a surface of a substrate where electric conductors are placed, and a second temperature adjusting mechanism for generating a heat

quantity to adjust a temperature of a further region on the surface of the substrate not covered by the vessel, wherein the heat quantity generated by the first temperature adjusting mechanism is different from the heat quantity generated by the second temperature adjusting mechanism, as set forth in Claim 1. Accordingly, the advantage of suppressing the temperature difference on a substrate to prevent cracking of the substrate cannot be provided by Sato and Suzuki, unlike the apparatus of Claim 1. For the above reasons, Claim 1 is deemed to be clearly patentable over Sato and Suzuki, whether considered separately or in combination.

Independent Claim 3 recites covering the electric conductors and one region on a surface of the substrate where the electric conductors are placed with a vessel which has an exhaust hole, to create an airtight atmosphere between the substrate and the vessel, wherein the vessel does not cover a further region on the surface of the substrate. Claim 3 also recites reducing a pressure of the airtight atmosphere, and heating the one region with a smaller heat quantity while heating the further region with a larger heat quantity so as to suppress a temperature difference between the one region and the further region.

For reasons substantially similar to those set forth above in connection with Claim 1, it is respectfully submitted that nothing in either Sato or Suzuki would teach or suggest the foregoing features of Claim 3. Accordingly, Claim 3 also is believed to be patentable over Sato and Suzuki, whether considered separately or in combination.

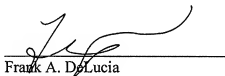
The other, dependent claims in this application each depend from Claim 1, and therefore partake in its patentability. Nonetheless, given that each dependent claim

recites an additional aspect of the invention, the individual reconsideration of each on its is respectfully requested.

In view of the foregoing amendments and remarks, Applicants respectfully request favorable reconsideration and early passage to issue of the present application.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read 'Frank A. DeLucia', is written over a horizontal line.

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